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REPORT NO

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COUNTRY Czechoslovakia

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SUBJECT The S-102 (MIG-15) and S-103 (BIS)  
Czech Jet Aircraft

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DATE OF INFORMATION

REFERENCES:

PLACE ACQUIRED

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THIS IS UNEVALUATED INFORMATION

SOURCE

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I. GENERAL:

The MIG-15 type aircraft in the Czechoslovak Air Force bore the Czechoslovak designations, S-102 and S-103. The S-102 is the MIG-15 powered by the M 05 (which is the Czech designation for the engine in the MIG-15) centrifugal flow turbojet of 2,450 kg. static thrust (this would correspond to the Soviet RD-45f engine which is rated at 2,270 - 2,360 kg. static thrust; although the thrust figure given from hearsay information - is somewhat higher). The S-103 is the MIG-15 Bis powered by the M 06 (Czechoslovak designation for engine in Bis type airplane) centrifugal flow turbojet engine of 2,650 - 2,750 kg. static thrust (this engine corresponds to the Soviet VK-1 engine, which is known to be in the MIG-15 Bis, of 2,700 - 2,790 kg. static thrust).

a three-view drawing (Enclosure 1) of the S-102 (MIG-15) and indicated the differences evident on the S-103 (MIG-15 Bis). Listed below they are:

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	<u>MIG-15 (S-102)</u>	<u>MIG-15 (Bis) (S-103)</u>
Rate of climb		Higher than S-102 model
Engine	M 05 (2,450 kg. static thrust)	M 06 (2,650-2,750 kg. static thrust)
Radio altimeter	None	Installed
ARK automatic radio compass	None	Installed
Rear fuselage fuel tanks	"U" shaped tank in rear fuselage section under engine tailpipe	Unknown (Note: MIG-15 Bis ordinarily is equipped with two individual rear fuel tank units)
Flare launcher	Located in rear fuselage section, lower right side (Flares fire downward)	Located in rear fuselage section, upper right side (flares fire upward)
Auxiliary wing tanks	250 lit.	Greater than 250 lit.; stabilizing horizontal tailplane added to rear part of tank
Vertical camera installation	Installation can be made directly below pilot in lower fuselage section	None
The maximum horizontal flight speed was [ ] 1040 km/hr 50X1 for both airplanes.		

II. S-102 (MIG-15)

A. General

The designation S-102 has been adopted by the Czechoslovak Air Force as the official designation for the Soviet-designed MIG-15. Source thought that the first MIG-15's arrived from the USSR during 1950 [ ] they came crated). Some of these air-

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[ ] hich were delivered to them. The Czechoslovak-built S-102's [ ] 50X1  
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[ ] below the Czechoslovak Air Force emblem on the left side of the vertical stabilizer. [ ] 50X1

The MIG-15 aircraft delivered from the USSR also had Soviet-build jet engines. After a period of time (Source did not know what date they first started appearing) Czechoslovak-built S-102's (with Czechoslovak-built M 05 engines) appeared in the regiments.

B. Performance and Characteristics:

[ ] Note: Checking over the drawing [ ] 50X1  
[ ] the Czechoslovak S-102 can be seen to correspond to the Soviet MIG-15 (with RD-45f type engine). The following data [ ]  
[ ]

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Designation S-102

Engine M 05 (2,450 kg. static thrust)

Armament 2 x 23 mm NS  
1 x 37 mm

Gunsight ASP-3N (Old Soviet MIG-15 airplanes had ASP-31 gunsight)

Fuel capacity main fuselage tank 1,040 lit.  
rear fuselage "U" tank 420 lit.  
2 wing drop tanks 250 lit. each

(Note: The larger drop tanks, with additional horizontal tail stabilizing fin, [redacted] could also be used. He did not know its capacity).

Max. level flight speed 1,040 km/hr

#### C. Aileron Boost Controls:

Source stated that the first MIG-15's delivered from the USSR did not have aileron booster controls. However, the S-102's (MIG-15) built in Czechoslovakia were equipped with aileron booster controls. [Note: [redacted] the M 05 engine then was equipped with an additional hydraulic booster pump which used a red hydraulic fluid. [redacted] on an airplane with this installation and did not know where the extra booster pump was located. Since the Soviet RD-45f engine accessory section did have an additional drive pad which could possibly be used to drive an extra hydraulic pump, this modification appears possible. [redacted]

[redacted] S-102 aircraft were equipped with booster controls but believed that the majority were so equipped.

#### D. Vertical Camera Installation:

The S-102 had a vertical camera installation located directly below the pilot. The space was in all aircraft but Source did not know how many aircraft had vertical cameras installed.

#### E. Armament:

During May-June 1953 several mechanics were sent to the Air Research Institute in Prague to help develop an external bombing installation on the S-102. The project consisted of installing an anti-tank type of bomb (weight or particulars unknown) on the external shackles of the S-102. According to Source this idea had to be abandoned due to damage suffered by the aircraft wing structure during bombing tests. Source had never seen bombs mounted on any S-102 or S-103 aircraft.

[redacted] the S-102 and S-103 could carry an external rocket installation. A rocket carrier was mounted on each wing tank shackle and carried rails for launching 16 rockets (total of 32 rockets). They were told this installation was in use on MIG-15's in the USSR. (Source had never seen or heard of such an installation on any S-102 or S-103 in Czechoslovakia. He did not know if it was a cluster or single-spaced rocket arrangement.)

#### F. Fuel Tanks:

The main fuselage fuel tank of 1,040 lit. capacity was constructed from a rubberized material. The rear "U"-shaped tank of 420 lit. capacity was of light alloy metal construction.

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The wing drop tanks were constructed from two types of material; light metal and a fiber-bonded material. All S-102 and S-103 airplanes that were delivered from the USSR to Czechoslovakia came equipped with wing drop tanks constructed from a fiber-bonded material. The bonded construction was composed of several layers of cloth. (Source referred to the paper as Tvrzeny paper.) Total thickness of the tank walls was one centimeter. The tanks were made up of several circular cross sections bonded together. Source did not know how the sections were joined together. A strip of cloth was bonded around the exterior of each joint.

These fiber tanks leaked at the wing attachment points and were discarded in favor of the Czechoslovak-made light metal tanks.

#### G. Engine:

The engines installed in the S-102 was designated M 05 (this appears to be equivalent to the Soviet built RD-45f). (This same Czechoslovak engine designation appeared on a bill of materials dated 5 February 1952 obtained from the Jan Sverma Factory in Prague, manufacturing the engine, [redacted] Component manufacture and assembly is done at [redacted] Prague-Letnany. Assembly of complete engines is performed at Motorlet, Prague-Jinonice. The engines are then sent to Stara Boleslav for testing. (Accepted production engines are then shipped to the Vodochody Plant for installation in the S-102 airframe).

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The only performance data [redacted] was a maximum thrust figure of 2,450 kg. at 12,300 rpm. 50X1

Accessories included engine starter, generator, hydraulic pump (in some cases an extra hydraulic pump for aileron booster control). Source did not know any of the part designations. An engine fire extinguisher system such as used for the Soviet RD-45f was also included. Source had never heard of the Soviet designation for the MIG-15 or MIG Bis engine (RD-45f and VD-1).

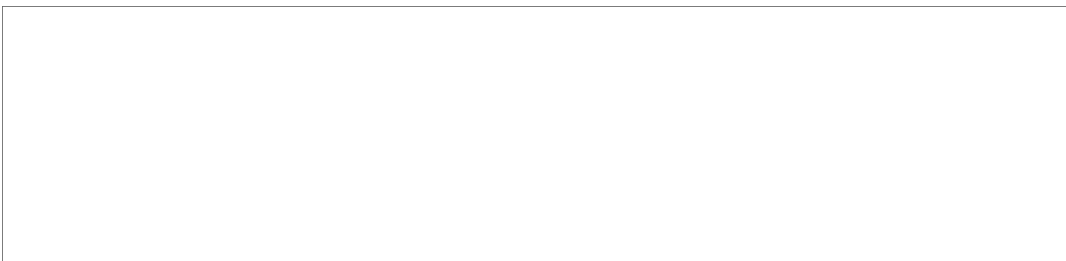
The engine lines were coded in the following way:

Hydraulic pressure	gray (also banded)
Fuel	yellow
Oil	brown
Air pressure	black
Fire extinguisher fluid	red

This is the same engine color coding procedure followed by the Soviets.

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#### H.



#### I. Fuel and Oil:

Fuel used (for M-05 and M-06 engines) was a kerosene type (straw-colored) designated LRX-52. [redacted] "I" represented "air" (referring to air force, etc.) and the "R" meant "for jet aircraft". The fuel was a mixture of kerosene with an additive of LM-120 oil plus stearic acid (ratio unknown).

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Oil used was designated LM-100 and LM-120. (A change to winter grade oil was made during the period 15 October - 15 November; change to summer oil was made during the period 15 March - 15 April. [redacted] (LM-100 or LM-120) referred to summer or winter).

#### J. Production of S-102 Aircraft:

Source stated that S-102 aircraft produced in Czechoslovakia were being shipped to Rumania, Hungary, Poland, and Bulgaria. [redacted] military pilots who were ferrying S-102 aircraft to these countries. They recounted an incident that occurred in December 1953 when 50 S-102 aircraft were being ferried to Rumania. The flight encountered bad weather and they were forced down at Zatec. Ten aircraft remained at Zatec and were turned over to a squadron; the other 40 were later ferried to Rumania. [redacted] Zatec was to receive 10 aircraft at a future date, this opportunity was taken to leave 10 aircraft there and "fill the order". Source did not know if such large flights were common or how many aircraft had been shipped out of Czechoslovakia. He knew of one other case when six S-102 aircraft were to be sent to Poland but defects were discovered and they were not shipped out [redacted].

#### III. CS-102 (U-MIG-15):

The CS-102 was the Czechoslovak designation for the Soviet U MIG-15 trainer (engine installation conformed to the RD-45f). There were some differences from the S-102 such as:

- The CS-102 was equipped with the ARK (automatic radio compass) installation, which the S-102 did not have.
- Additional installation of a radio altimeter.
- Armament changed to only one gun (Source did not know what type or where located).

All of the above features would help the student pilots in checking out in the newer S-103 (MIG-15 Bis) since the Bis is better equipped for instrument flying, due to the addition of the ARK and radio altimeter equipment. All CS-102 aircraft [redacted] were of Soviet origin.

#### IV. S-103 (MIG-15 Bis):

The Soviet MIG-15 Bis (Soviet designation) was designated by the Czechs as the S-103 (there was no CS-103 trainer version). The S-103 was equipped with a centrifugal flow turbojet engine designated M-06 by the Czechs. (Maximum thrust was [redacted] 2,650-2,750 kg., which would correspond to the Soviet VK-1 which is known to be in the MIG-15 Bis). See paragraph I and Encl. 1 for further details on the S-103. Source had never heard of IFF [redacted] any antennas on the S-102 and S-103 that would indicate such an installation [redacted] one radio altimeter antenna unit on the right wing, none on the left wing - such as the MIG-15 Bis is known to have.)

##### A. Wing Drop Tanks:

The MIG-15 Bis aircraft which were sent from the USSR were first shipped with a drop tank larger than the 250 lit. tank of the MIG-15. The approximate dimensions were three meters long, one-half meter maximum diameter. The tank was also distinguished by the addition of a horizontal stabilizing fin at the tail end

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of the tank /see Encl. 17. These tanks were made of a bonded fiber composition (same as the S-102 tanks sent from the USSR) /see paragraph 17).

The fiber tanks leaked and as a result the 250 lit. metal tanks (as used for the S-102) were substituted. [redacted] 50X1  
a metal version of the new and larger drop tank. No fiber tanks were made in Czechoslovakia.

B. Production of S-103 Aircraft:

The first MIG-15 Bis parts (crated) arrived from the USSR in the summer of 1951. Engines were also Soviet built. These aircraft (number unknown) were assembled by Czech airmen at Mlada. In addition, mechanics from all four fighter regiments of the Headquarters 4th Fighter Division learned the assembly of the MIG-15 Bis at Mlada.

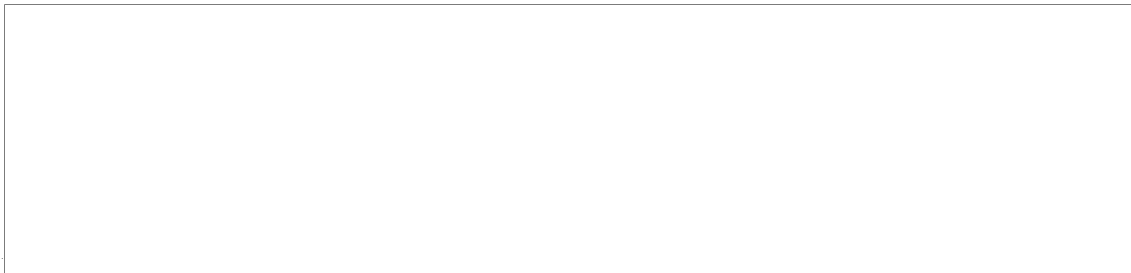
In December 1953, some mechanics [redacted] went to the Rudy Letov plant in Prague to pick up some S-102's. They reported that parts for the S-103 were being made there at that time. 50X1

In January-February 1954, [redacted] Let-01 in Kunovice [redacted] 50X1  
[redacted] upper sections of the vertical stabilizer for the S-103 were being made there. The ARK radio compass unit is being made at the Tesla Electronic Plant in Kolin.

The M-06 turbojet engine for the S-103 is being made at Prague-Letnany. All engine assembly, [redacted] is 50X1  
being done at the Motorlet Plant at Prague-Jinonice. The engines are then sent to Stara Boleslav for testing.

The final assembly of the engine in the S-103 is done at Vodochody. Acceptance test flights are also conducted at Vodochody. Source has no production figures.

V.



ENCLOSURE:

A three-view drawing of the S-102 (MIG-15) and Indicated Differences Evident on the S-103 (MIG-15 Bis).

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